

# TEAMBUILDING IN CONSTRUCTION PROJECT PROCUREMENT: A STUDY OF TRADITIONAL AND INTEGRATED METHODS IN NIGERIA

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## ABSTRACT

Construction projects are centres of action from teams that are often times temporary, extant and multidisciplinary. In addition to technical factors and availability of resources, the teambuilding traits that exist among project team members or participants in the project procurement has effect on the achievement of project objectives. This study set out to investigate teambuilding traits in projects executed through the traditional procurement method and those executed through the integrated method. The study also sought to determine if any significant differences exist in those traits between the two methods. Through the use of purposive sampling, questionnaires were administered on 274 projects located in twelve states of Nigeria and the Federal Capital Territory, Abuja. Data was obtained on 94 out of the targeted projects. The research used a modified teambuilding instrument to assess the presence of teambuilding traits in projects executed through the two procurement methods. Descriptive and inferential statistical tools were used for the analysis. The results suggest that 'members understand(ing) how their portion of project is important to overall project' ranked highest for both the traditional procurement method and the integrated method. 'There is conflict resolution plan' ranked least for the traditional procurement method while 'Reward systems encourage team/non-adversarial relationships' ranked least for integrated method. The analysis further indicates that significant differences exist between the two methods on the following traits, 'Goals and standards are established/agreed for each project participant or team member', 'Reward systems encourage team/non-adversarial relationships', 'The project team consists of right quantity and quality of members necessary to accomplish project goals'. No significant differences exist in the remaining twenty items. The study recommends a more detailed study of each trait for a relationship to project outcome.

**Keywords:** Teambuilding, construction project procurement

## 1. INTRODUCTION

The construction industry is an industry replete with challenges of a highly mobile workforce with differentiation and fragmentation of participants who are sometimes from different professional or commercial entities. The differentiation and fragmentation in the industry sometimes leads to reduced efficiency in project delivery and lack of parity in the performance of the industry in relation to other industries of national economies (Egan, 2002 and 1998; Baiden *et al*, 2006). While the advances in information and communication technology have brought about the emergence of virtual teams, teams for the implementation of any project can be conventional or physical as well as virtual or distributed (Lee-Kelley, 2006; Kozlowski and Ilgen, 2006). Lee-Kelley (2006) alluded to increasing challenges in the workplace, emphasis on immediacy in every day transactions as conditions that have led to the growth of virtual teams. While referring to Kraut *et al* (1998), and Ahuja (2000), Lee-Kelley (2006) hinted that despite the advantages of information and communication technology in making work easier, the place of personal linkages and social interactions remains a crucial way to mitigate any perceived consequences. The construction project depending on procurement methods can be executed through the use of intra-organisational teams or inter-organisational teams. In essence,

construction projects are executed through a coalition of individuals often representing diverse interests and coming from different backgrounds.

Teambuilding is the process of taking a collection of individuals with different needs, background and expertise and transforming them into an integrated and effective work-unit (Thamhain, 1988 Fleming, 2000). Emphasis on teambuilding to enhance collaboration along multidisciplinary lines and also to achieve project objectives has been reported in many fields of human endeavour (Brown et al; 2003; Orchard et al ,2005; Shaw et al, 2007; Lee-Kelley, 2006). Researchers have also identified the existence of a positive relationship between teambuilding and achievement of organizational objectives (Thomas *et al*, 1999; Albanese, 1994). Furthermore, evidence from literature and research suggests that apart from technical issues, personality and group relationship issues, though intangible, can significantly affect the outcome of a given project or endeavour. This finding is also applicable to the construction industry (Fryer, 1991; Albanese, 1993; Walker, 1995; Dada, 2007). In addition, team performance, which is regarded as part of project culture, was found to be related to project procurement form. A study by Rowlinson and Root (1994) cited by McDermott (1999) confirms this view. Walker (1995) suggests that the relationship that exists between the client and other members of the project team affect the speed of construction.

Procurement comprises the series of activities that occur in bringing about a building project. The separated method, sometimes called the conventional method or the traditional method or the design–then–build method or the design–bid–build method, imposes divided responsibility contractually and organizationally between consultants and contractors. The organizations act in a presumed close relationship in order to achieve the project but are individually accountable to the client. A partition, as it were, exists between the contractor and designer. The main characteristic of the traditional method is the contractual separation of design from construction (Ojo, 2009). In Nigeria, like some other countries, the most dominant method for procurement of building works is the traditional method (Gordon, 1994; Ling, Ofori and Low, 2003; Nubi, 2003; Idoro *et al* 2007; Babatunde et al, 2010)).

In the integrated method, the design and construction are done under a single organizational umbrella. The concept seeks to overcome the limitations of the traditional method by giving the client a single-point responsibility. Examples of the integrated method are the design-and-build, turnkey, package deal, build-operate-transfer with their respective and attendant variants.

The inadequacy of the use of the traditional measures of time, cost and quality for measuring project success has been highlighted in literature (Baiden *et al.*,2006). Other surrogate or qualitative measures are also important. It is in this context that this research seeks to examine the teambuilding traits in the traditional and integrated procurement methods being used in the construction industry. This study has the potential of providing insight into team behavior in the procurement methods and may form a basis for selection of methods based on desired team effectiveness or team performance.

## **2. TEAMBUILDING: PSYCHOLOGICAL AND SOCIOLOGICAL PERSPECIVES**

Fraser and Neville (1999) and Baker (2000) define a team as a group of people working together to achieve common objectives. Katzenbach and Smith (1993) as cited by Fleming and Koppleman (1997, p .5) define a team as ‘a small number of people with complimentary skills who are committed to a common purpose, performance goals and approach for which they hold themselves mutually accountable’ Kozlowski and Ilgen (2006, p 3) define a team as ‘two or more individuals who socially interact, face-to-face or virtually, who possess one or common goals, who are brought together to perform organizationally relevant tasks, exhibit interdependencies with respect to workflow, goals and outcomes, have different roles and responsibilities, and are together embedded in an encompassing organizational system with boundaries and linkages to the broader system context and task environment’. Sommerville and Dalziel (1998) said that in the past, project success was viewed to be contingent exclusively on the efforts of an individual. However they said that there exists at present a general consensus that many of the qualities of a good manager are mutually exclusive and it is effective teams and not specific individuals which are necessary for the continual growth, development and day-to-day management of an organization.

Other than these definitions and concepts, some theories have been propounded in the study of teamwork. Margerrison and McCann (1995) hinted on two approaches to viewing individuals as they stand with respect to a team. The two approaches are the sociological and the psychological. The sociological view asserts that when people work together, they do so not just as individuals but also in the roles which fit the demand of the organization. Margerrison and McCann (1995) referred to the

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works of Weber (1946) and noted that bureaucracies are brought into being by the formation and assumption of roles. People relate to each other not only in terms of their own personality and interests but also in terms of roles definition and the expectations of others. This sociological view tallies with the concept of Robbins (1998) who, apart from the psychological perspective, interprets behaviour in an organisation from the structural perspective. The psychological view indicates that human beings have preferences and personalities and these are brought to play in groups.

Theories from the sociological perspective include that of Meredith Belbin (Fryer, 1991; Senior, 1997; Sommerville and Dalziel, 1998) who sought to assign roles to individuals in a team. Some theories from the psychological perspective include that of Eyesinck who also developed the Eyesinck personality inventory. The fundamental interpersonal relationship orientation developed by William Schutz and the Myers Briggs Type Indicator, developed by Myers Briggs, are all instruments developed from psychological theories (Hill and Somers, 1988). Margerison and McCann (1995) however combined the two perspectives - the sociological and the psychological - to develop what they called a managerial approach to the study of individuals and interactions in teams.

Kozlowski and Ilgen (2006) reviewed theories and research works in the last fifty years in literature on teams from both the social psychological perspective up to the organizational psychology perspective. They reported the shift in research from the study of small interpersonal groups in social psychology to the study of teams in organizational psychology. Kozlowski and Ilgen (2006) further dwelt on team effectiveness which also affects organizational goals. They wrote on both the static and dynamic view of team effectiveness. According to Kozlowski and Ilgen (2006), from their review, the conceptualization of team effectiveness has graduated from the static input-process-output model to the more recent perspective that conceptualizes the team as embedded in a multi-level system that has individual, team and organizational levels, focusing on task related processes and incorporating temporal dynamics. Kozlowski and Ilgen (2006) also said that the task of teams determines two critical issues: aggregation or constellation of team member individual differences and capabilities and the primary focus of team members. In this regard, this perspective differs from the social psychological perspective of the study of teams in which the task is merely a means to prompt interpersonal relations and interactions to an organizational perspective in which the task is the source of goals, roles and task based exchanges. The thrust of the concept includes the fact that there must be a task that binds team members together and on which the team effectiveness can be assessed.

Some construction industry researchers have worked on matters relating to teambuilding in construction procurement. Baiden *et al* (2006) asserted that attempts at team integration in the construction industry have been largely focused on improving project procurement and project delivery process. Collaborative and integrated procurement methods were reported to have been used to encourage team formation and collaboration in the industry. They further reported that many of these attempts have not fully achieved the expected success probably because of the superimposition of the methods on environments where adversarial cultures and attitudes still exist. They reported findings on projects using project managers who have been acknowledged to have excelled in the management of project teams measured against a wide range of assessment criteria. Their results indicate practices that suggest full, partial or absence of integration. The study further revealed that the level of integration is affected by team practices adopted, set within the context of procurement approach.

Tippet and Peters (1995) examined the concept of teambuilding to determine their presence or otherwise on some projects. They used Robert P. Hagen's key elements of most successful teambuilding plans for their work. The key elements include: (1) In all actions, demonstrate respect and consideration for all employees as valued members of the team; (2) Identify individual job responsibilities and performance standards and see that they are known; (3) Work to secure good communications with employees as individuals and as a team; (4) Establish individual and group goals, preferably in co-ordination with those concerned; (5) Reward teamwork and teambuilding efforts; and (6) Practise and encourage loyalty to the team. While these key elements have sub-items, the distillate from Fleming (2000), and Moore and Dainty (2001) and other sources individually or collectively concur with Robert P. Hagen's key elements of successful teambuilding which still hover around project sponsorship and upper management support, project goals, scope and objectives, leadership, membership and resources, communication, team authority and autonomy, performance/reward system, relationship and team dynamics (consensual decision making).

### 3. RESEARCH METHODS

The research was conducted through the examination of relevant literature on teambuilding traits and procurement methods. The data collection instrument used is a project specific questionnaire. It sought to know how an already executed/on-going project performed or was performing. It sought to know respondents' personal data. It also sought to obtain some other biographical data on the projects such as project location, among others. Further biographical details judged relevant on the client, contractor, and consulting organizations were demanded. Thereafter, respondents were demanded to tick the procurement method used for the project. Respondents were asked to assess team relationships on the project using an inventoried, modified teambuilding instrument - the Robert P. Hagen's six key elements of successful teambuilding used by Tippet and Peters (1995). The instrument addressed key elements of successful teambuilding which were further subdivided into smaller items. The statements indicating the presence of those traits and which respondents were to respond to were constructed in an ordinal manner thus: 4 implies 'strongly agree'; 3 implies 'agree'; 2 is 'disagree'; and 1 is 'strongly disagree'. The instrument was deliberately constructed in that way to make respondents think on and reflect on team relationships which necessarily existed among the members. Respondents were required to take a position on the issue. Respondents were requested to assess the presence or otherwise of the teambuilding traits among project members in the course of the project execution. The instrument was modified in the study in the area with respect to the levels and gradation of measure. The modified instrument was tested to ascertain the effect of the amendment of some items using Cronbach's alpha. The Cronbach's alpha has the potential of ascertaining inter-item correlations and reliability. A reliability coefficient of 0.96 was obtained. The level of significance for the reliability tests reported herein were all 5%. The reliability value is judged to be relatively high enough considering some previous works (Kaming et al., 1998).

274 copies of the prepared questionnaire were sent out to elicit questions on already executed or on-going construction projects. 97 completed copies were returned and received. The average response rate to the questionnaires was thus about 35%, which is judged acceptable in view of researches in same field (Moser & Kalton, 1971 as cited by Mills & Skitmore, 1999). The respondent on any of the project could be a representative of any of the following organizations- client, contracting or consulting organizations. This was partly due to the impracticability of getting representatives of the three organizations on all projects especially the ones that had been completed as at the time of questionnaire administration. Co-location of project participants on such projects had ended before administering the questionnaire. The level of significance for decision-making on the statistical analysis was set at 5%.

### 4. ANALYSIS, RESULTS AND DISCUSSIONS

Some descriptive data generated from the project specific questionnaire are reported in this research. 54% of the projects were located in Lagos State while the remaining 46% were located in the eleven states including the Federal Capital Territory. Lagos houses the highest number of projects used for the study.

Table 1 shows the projects used for the study based on the procurement method used.

**Table 1:** Projects and procurement methods used

Procurement method	Frequency	Percentage
Integrated method	30	30.90
Traditional method	64	66.00
Not indicated	3	3.10
Total	97	100.00

30 (30.90%) of the projects were executed by integrated methods while 64 (66.00%) were executed by traditional method. For the integrated procurement method (which has a response size of 30) however, design and build projects were 26 (86.7%), package deal 1(3.33%) project, turnkey 1(3.33%) project while build operate transfer or variant were 2 (6.67%).

The characteristics and composition of the design team are shown in Table 2.

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**Table 2:** Characteristics and composition of the design team

Design team composition	Frequency	Percentage
In-house team	45	47.37
Mixed team	18	18.94
External team	32	33.69
Total	95	100.00

45 (47.37%) of the projects were designed by in-house team, 32 (33.69%) by external team while 18 (18.94%) were designed by a mixed team.

Table 3 shows the characteristics and composition of the construction team.

**Table 3:** Characteristics and composition of the construction team

Design team composition	Frequency	Percentage
In-house team	26	27.37
Mixed team	48	50.52
External team	21	22.11
Total	95	100.00

26 (27.37%) of the projects were constructed/being constructed by in-house team, 48 (50.52%) by external team while 21 (22.11%) were designed by a mixed team.

Table 4 shows the items that constitute the teambuilding traits and the respective mean item scores obtained on the respective methods and projects. The table shows that on the basis of mean item scores, the issue ‘members understand how their portion of project is important to overall project’ ranks highest for both the traditional procurement and the integrated procurement methods. The statement that ‘there is conflict resolution plan’ ranks lowest on aggregating the mean item scores of the responses of the two groups. However the existence of a conflict resolution plan ranks least for the traditional procurement method.

‘Reward systems encourage team/non-adversarial relationships’ ranks least in the integrated procurement method. Apart from the last four teambuilding traits in table 4, the mean item scores on the teambuilding traits are higher for the integrated method than the traditional method. This is to be expected because, on the surface as far as organizational integration is concerned, integrated methods are expected to be better. However there is need to test whether significant statistical differences exist in the teambuilding traits on projects executed through the two procurement methods. This leads to the hypotheses testing whose results are presented in table 5.

The next step in the research is to investigate whether there are significant differences between the teambuilding traits of the traditional procurement method and integrated procurement method. In this regard, the following hypotheses were set up:

*Null Hypothesis (H<sub>0</sub>): There is no significant difference in the teambuilding traits on projects executed with the traditional procurement method and those executed with integrated method*

*Alternative Hypothesis (H<sub>1</sub>): There is significant difference in teambuilding traits on projects executed with the traditional procurement method and those executed with integrated method*

Table 5 shows the results of the analysis. The results show that among all the items the following indicate items where there are no significant differences.

Table 5 shows the t-test results of the teambuilding traits in the two procurement methods. The degrees of freedom are all 95. The inferential analysis further indicates that significant differences exist between the two methods on the following traits, ‘Goals and standards are established/agreed for each project participant or team member’, ‘Reward systems encourage team/non-adversarial relationships’, ‘The project team consists of right quantity and quality of members necessary to accomplish project goals’. With regard to the remaining twenty teambuilding traits, this research did not provide enough evidence to conclude that there are significant differences in the traits between the two procurement methods. No significant differences exist in the remaining twenty items. The finding suggests that real life practices in teambuilding may not approximate to the ideal. This can partly be explained by the fact that the use of integrated methods implies some measure of organizational integration, team members may not necessarily perform in teambuilding traits in those methods. The

possible explanation is that some of the traits are behavioral which may not necessarily be imposed by the structure or organization of the procurement methods. This research finding from the statistical test is thus consistent with the submission of Walker (1995) that it is the quality of relations and team performance that contributes to success rather than just the prescription of a particular procurement system for a given set of conditions. The finding also seems to support Baiden *et al* (2006)'s call for behavioural and cultural improvement to generate more suitable project cultures in an attempt to help project team to meet project requirements at the right cost and on time.

**Table 4:** Mean item scores and ranking of teambuilding traits in the procurement methods

Team trait or variable	TMI	TMR	IMI	IMR	AMI	AR
Members understand how their portion of project is important to overall project	3.16	1	3.77	1	3.33	1
Client's management define the project goals	3.08	2	3.53	3	3.23	2
The project team consists of right quantity and quality members necessary to accomplish project goals	2.84	9	3.60	2	3.09	3
Each participant feels his inputs and suggestions are valued	3.05	3	3.30	8.5	3.08	4
Project participants agree with project goals	2.98	4	3.23	6.5	3.07	5
Regular exchange, site or project meetings are held	2.94	5	3.31	4	3.04	6
Goals and standards are established/agreed for each project participant or team members	2.86	8	3.30	5	3.01	7
Project team norms encourage high quality and success	2.8	6	3.23	6.5	2.97	8
There is climate of trust in the project team	2.87	7	3.13	12.5	2.95	9
There is strong support for client's top management for the teams success on the project	2.78	12.5	3.20	8.5	2.93	10
Goals are established to encourage growth in teambuilding, good and mature working relationships to achieve project goals	2.81	10.5	3.17	10.5	2.92	11
Project participants are encouraged to respect one another	2.81	10.5	3.17	10.5	2.91	12
Effective leadership is practiced	2.78	12.5	3.10	15	2.87	13
Project participants know enough about each other to appreciate contributions others are making	2.71	14.5	3.10	15	2.81	14.5
All participants or project team members are carried along in decision making	2.71	14.5	3.10	15	2.81	14.5
The project team utilizes feedback about its effectiveness to make improvements in how it is functioning	2.70	16	3.13	12.5	2.80	16
Project team norms (ways of doing things) encourage innovative solutions or problem solving	2.59	19	3.00	17	2.70	17
Members give and receive regular and constructive feedback on how they are doing	2.59	19	2.97	18	2.68	18
Consideration is given to each individual for professional satisfaction on the project	2.51	21	2.70	20	2.57	19
Project team encourages quality at first attempt	2.43	22	2.73	19	2.54	20
The project team accepts members who behave differently as long as their behavior is perceived as helpful to project success	2.59	19	2.57	21	2.57	21
Reward systems encourage team/non-adversarial relationships	2.60	17	1.97	24	2.39	22
There is reward for innovative solutions	2.32	23	2.23	22	2.28	23
There is conflict resolution plan	2.20	24	2.17	23	2.24	24

TMI = Mean item score for traditional method; TMR = rank for the traditional method; IMI = Mean item score for integrated method; IMR = rank for integrated method; AMI = aggregated mean item score; AR = aggregated rank

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**Table 5:** T-test results on teambuilding traits in the procurement methods

Item	Trait	t-value	Significance	Decision
1	Client's management define the project goals	-1.971	0.052	Accept H <sub>0</sub>
2	Project participants agree with project goals	-1.092	0.278	Accept H <sub>0</sub>
3	Goals and standards are established/agreed for each project participant or team member	-2.103	0.038	Reject H <sub>0</sub>
4	There is strong support for client's top management for the teams success on the project	-1.620	0.109	Accept H <sub>0</sub>
5	Project participants are encouraged to respect one another	-1.569	0.120	Accept H <sub>0</sub>
6	Project participants know enough about each other to appreciate contributions others are making	-1.557	0.123	Accept H <sub>0</sub>
7	Members understand how their portion of project is important to overall project	-2.823	0.006	Reject H <sub>0</sub>
8	Each participant feels his inputs and suggestions are valued	-0.677	0.500	Accept H <sub>0</sub>
9	Members give and receive regular and constructive feedback on how they are doing	-1.554	0.124	Accept H <sub>0</sub>
10	The project team utilizes feedback about its effectiveness to make improvements in how it is functioning	-1.828	0.071	Accept H <sub>0</sub>
11	Regular exchange, site or project meetings are held	-1.622	0.108	Accept H <sub>0</sub>
12	All participants or project team members are carried along in decision making	-1.753	0.083	Accept H <sub>0</sub>
13	Consideration is given to each individual for professional satisfaction on the project	-0.843	0.402	Accept H <sub>0</sub>
14	Project team norms (ways of doing things) encourage innovative solutions or problem solving	-1.714	0.09	Accept H <sub>0</sub>
15	There is reward for innovative solutions	0.350	0.727	Accept H <sub>0</sub>
16	Project team norms encourage high quality and success	-1.489	0.140	Accept H <sub>0</sub>
17	Project team encourages quality at first attempt	-1.032	0.305	Accept H <sub>0</sub>
18	Goals are established to encourage growth in teambuilding, good and mature working relationships to achieve project goals	-1.620	0.109	Accept H <sub>0</sub>
19	The project team accepts members who behave differently as long as their behavior is perceived as helpful to project success	0.094	0.925	Accept H <sub>0</sub>
20	There is conflict resolution plan	0.415	0.679	Accept H <sub>0</sub>
21	There is climate of trust in the project team	-1.140	0.257	Accept H <sub>0</sub>
22	Effective leadership is practiced	-1.375	0.173	Accept H <sub>0</sub>
23	Reward systems encourage team/non-adversarial relationships	2.633	0.010	Reject H <sub>0</sub>
24	The project team consists of right quantity and quality of members necessary to accomplish project goals	-3.447	0.001	Reject H <sub>0</sub>

## 5. CONCLUSION AND RECOMMENDATIONS

The study investigated two procurement methods for the presence of teambuilding traits. The two methods used were the traditional and integrated methods. The findings indicate that there are no differences between the two methods in twenty out of the twenty four items used in the instrument.

The research findings raise fundamental questions and suggestions pointing to the fact that even though there are organizational differences in the traditional and integrated procurement methods, with the integrated method expected to hold the possibility of better teambuilding performance, statistical and real life evidence do not support significant differences in majority of the teambuilding traits in the two procurement methods. The research and practice implication is that there is a gap between the expected ideal situation and the real life experiences. Furthermore, the outcome of the study points to the fact that the quality of relations and team performance that contributes to success rather than just the prescription of a particular procurement system for a given set of conditions. One recommendation may be to explore in details the teambuilding elements where there are no significant differences. There may also be need to answer in future for both practice and research some questions: Where there are significant differences in teambuilding traits between the two procurement methods, in what direction do the differences occur? Where the traditional method or the other procurement methods overcome limitations in areas of differences, will the two methods approximate to each other? The study recommends a more detailed investigation of each trait for a relationship to project outcome.

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